Prius Optima YELLOWTOP Type: DS46B24R

These batteries are dual-purpose. They are designed for engine start and cyclic applications and for use in vehicles with large accessory loads. Recommended charging information:

Alternator:
13.65 to 15.0 volts, no amperage limit.
Battery Charger:
13.8 to 15.0 volts, 10 amps maximum, approximately for six to twelve hours.
Cyclic Applications:
14.7 volts, no current limit as long as battery temperature remains below 125°F (51.7°C). When current falls below one amp, finish with two-amp constant current for one hour.
Rapid Recharge:
Maximum voltage 15.6 volts (regulated), no current limit as long as battery temperature remains below 125°F (51.7°C). Charge until current drops below one amp.
Float Charge:
13.2 to 13.8 volts, one amp maximum current, time indefinite (at lower voltage).
Strictly adhere to all limits.

In time, AGM batteries, including OPTIMA® batteries, will fail. Premature failures are often caused when a starting battery is used in a cycling application, for which a deep-cycle battery is the better choice.

OK, so you have a seemingly bad AGM battery, you attach it to your charger and…CLICK. The charger won't even charge it! "It must be a bad battery!" you exclaim. Or is it? In many cases, OPTIMA batteries that are assumed to be bad may actually be perfectly fine, but just deeply discharged.

The great thing about AGM batteries, including OPTIMA REDTOP® and YELLOWTOP® batteries, is that they have very low internal resistance. This allows very high amperage output, allowing your battery to power your accessories longer and deeper than a traditional battery, but at the same time deeply discharging it.

An AGM battery with its low internal resistance may stump car guys because sometimes it doesn't work like a traditional flooded lead-acid battery.

Here's the problem: Many battery chargers have built-in safety features that may prevent chargers from recharging deeply-discharged batteries. A traditional battery that's at 10.5 volts or less may be seen as defective, having either a short, a bad cell or some other issue. Many analog chargers are binary and are either on or off. If they don’t turn on, it may be because the charger thinks the battery is “bad.” Turning on to charge a “bad” battery could create an unsafe scenario. But the fact is that the AGM battery may be just fine; it has simply slipped below the minimum voltage threshold of the charger to turn on, and the charger doesn't know what to do with the battery, so it does nothing.

Here are three options for bringing that deeply discharged AGM battery back to peak operational performance.
Recovery Option #1: The Best Solution – AGM-Specific Chargers

The best method for recharging a deeply discharged AGM battery is to purchase a modern charger that has kept up with battery technology. Many chargers now have AGM-specific settings and desulfation steps that help recondition and recover deeply-discharged AGM batteries. These are becoming more common, and they work well for all lead-acid batteries. They have the additional capability of doubling as a battery "maintainer" for batteries in storage. Some come with additional ring terminals to permanently attach to your battery leads so you can charge the battery externally with an accessible charger or maintainer. This makes it easy to hook up when you store your car, truck, boat or RV.

The OPTIMA Chargers Digital 1200 12V Performance Battery Charger and Maintainer enhances the performance of OPTIMA and other AGM batteries, recovers deeply discharged batteries and extends battery life. The OPTIMA Chargers Digital 1200 12V Performance Battery Charger and Maintainer is optimized when used with high-performance AGM batteries, but has enhanced charging capabilities that can also be used with all traditional types of automotive batteries.

This is the preferred method of charging a deeply discharged battery and you can buy one here.
Recovery Option #2: The DIY solution for charging a deeply discharged battery.

This is a recovery method for the do-it-yourselfer using the equipment you have in the garage. With this option, you're going to "trick" your traditional charger into charging the deeply-discharged AGM battery.

Here's what you need:

- Battery charger (under 15 amps)
- Jumper cables
- A good battery, preferably holding voltage above 12.2 volts. (It can be an AGM or flooded lead-acid battery)
- The seemingly dead, deeply-discharged AGM battery
- A voltage meter
- A watch or timer

Here's what you do:

Hook up the good battery and deeply-discharged AGM battery in parallel – positive to positive and negative to negative. Do not have the charger connected to the battery or turned on at this stage.

Next, connect the discharged battery to the charger, then turn on the charger. The charger will "see" the voltage of the good battery (connected in parallel), and start delivering current.

After the batteries have been connected for about an hour, check to see if the AGM battery is slightly warm or hot to the touch. Batteries naturally become warm during charging, but excessive heat may be an indication that there really is something wrong with the battery. Discontinue charging immediately if the battery is hot to the touch. Also discontinue the process if you hear the battery "gassing" — a hissing sound coming from the safety valves. If it's hot or gassing, STOP CHARGING IMMEDIATELY!

With your volt meter, check back often to see if the AGM battery has charged to 10.5 volts or above. This generally takes less than two hours with a 10-amp charger. If it has, disconnect the charger from the wall outlet and remove the good battery. Now, connect only the deeply-discharged AGM battery to the charger. Turn on the charger and continue until the AGM battery reaches a full state of charge (at least 12.6V), or until the automatic charger completes the charge process. In most cases, the AGM battery will be recovered.
Recovery Option #3: Enlist the Professionals

If you don't own a battery charger, don't want to make the investment or you're not the do-it-yourself kind of person, this is the option for you.

Take the battery to a professional battery specialist who knows AGM technology. Most specialists are willing to provide "charge and check" procedures free or for a small fee. Auto parts stores are typically not capable of accurately determining an AGM battery's condition and many use conductance testers that don't provide correct readings. Battery specialists (such as Interstate Batteries and other independent battery distributors) are experts who can help determine if your battery is recoverable or not.

Tools You Need to Check Your Optima Battery

You're going to need a couple of things to check your Optima.

First, you need a multimeter or voltmeter. It needs to measure battery voltage, so you'll want to set it correctly. Most multimeters have a "20 VDC" position, and that's where you want to be.

Warning! You need to take fairly accurate readings of your Optima's voltage. We've found that some of the cheaper multimeters out there aren't always very accurate (like that free one from Harbor Freight) so keep that in mind if your readings are right on the edge of a zone.

It's helpful to have a vehicle so you can load test the battery, plus a helper.

Lastly, you should have a charger that charges AGM batteries. Many people don't know this, but a conventional battery charger won't work with an Optima battery that's discharged below 10.5V.

An alternative to an Optima-specific charger:

You can also use a regular battery charger with a regular battery to charge an Optima. Read more on that below.
Check the Little Things First

For some reason, many of us overcomplicate our solutions and diagnosis of problems (We do it here at Roundforge too!).

Before assuming your Optima has gone bad, check your battery connections for corrosion and tightness. This is probably one of the most common problem people have with batteries, but it's often not checked. This means:

Jiggling your positive battery clamp (lightly!) and looking for white powder
Jiggling your negative battery clamp (lightly!) and looking for white powder
Checking your starter and main power feeds for tightness
Checking your negative battery cable for tightness and corrosion
Checking any grounding straps - these will often go from the engine block to the body and/or from the engine block to the frame. Sometimes they are bare wire.

Clean corrosion with sandpaper so that you connect to clean, bare metal. Use a wrench to make clamps and other connections reasonably tight (but not so tight that you damage a battery post!).

Bad connections and particularly bad grounds are one of the easiest problems to fix but often one of the last things that we check! Always check your connections first!
Test the Voltage First

Before you start, make sure your Optima is "charged". What we mean by this is that it should be in whatever state you think is charged, whether that means that it's been on a charger for a bit or that you just drove around for a while.

(The point here is that you didn't just pull the Optima out of your shed where it's been sitting for the last 6 months, or that you're not testing it after using it to power the disco ball at your neighbor's midnight rave party. We want the battery in a normal state.)

To begin, switch your multimeter to 20VDC or whatever will get your multimeter reading somewhere in the range of 12 volts DC.

Put the red probe on the positive Optima terminal and the black probe on the negative Optima terminal.

This is your first reading - here's how to interpret it:

12.7 - 13.2 volts - NORMAL with 100% charge

Anything in this range means that you have normal charge and you're in the right range for an Optima.

12.0-12.4 volts - LOW with 25-75% charge

If your Optima is in this range and you think it should be charged, it's not taking or not holding a charge. This usually means that your battery is sulfated, which happens when it sits for a long time (not charging) or is deeply discharged when it shouldn't be. Or it's just old.

0-11.9 volts - DISCHARGED

This is highly discharged but usually still recoverable. 0 volts usually means that you've got a short somewhere in the battery - it'll need to be replaced. If it's reading a low voltage, it's probably sulfated and probably needs replacement.

Load Test Your Optima Battery

If your Optima's voltage is okay, it still might not perform well under load. You can load test it by going to an auto parts store (they all have battery testers nowadays) or do it yourself with a multimeter.

We load test it by hooking it up to a vehicle and checking the voltage while running the starter. Here's what to do:

Like before, your multimeter will be set to 20VDC, or whatever gets you in that 12 volt DC range.

Touch the red probe to the positive terminal on the Optima and touch the black probe to the negative Optima terminal.

Then have a helper try to start your 4x4. (Tip: If we're solo, we put the multimeter on the windshield and use long alligator clips to reach the battery.)

Watch the multimeter as the starter motor is turning, not when you're started up!

The voltage on your Optima should read 9.5-10.5 volts for at least 30 seconds.

When the starter motor is turning over the engine, that is the heavy load we're using to see how the battery performs. Once started, the alternator will start push the voltage up - we aren't interested in alternator voltage since that tells you about charging, not the condition of your Optima.

If the voltage doesn't hold at 9.5-10.5 volts for 30 seconds, it means your battery is toast. This is usually one of two things:

- Excess sulfation
- An open cell

The reason an open cell looks okay in no-load testing your Optima is heat:

A warm battery can expand inside and things that should touch don't touch anymore. Similarly, terminal contacts can break or crack internally. When cold, they may touch and flow current, but when they warm up they break contact.

Recharging a Dead Optima

Normal chargers won't always work with an Optima battery. It depends a lot on how deeply it's been discharged.

The reason for this is simple - Optimas are AGM batteries and AGMs have a very low internal resistance. The low internal resistance allows them to put out a lot of electricity and be discharged more than a regular battery. (Although repeated discharging a dark-cased RedTop or BlueTop is not good for longevity).

When a regular battery charger is hooked up to an Optima, it often won't even turn on - while the Optima could be charged, the charger thinks it's totally kaput (like a regular battery would be) and doesn't even come on. This usually happens when the Optima measures around 10.5 volts.

How do you fix this? You have two options:
Use an AGM-Compatible Charger For Your Optima
Optima 400 Battery Charger
This charger works for Optima batteries, as well as non-AGM batteries.

If you buy a charger for AGM batteries, it's easy to charge up a dead AGM. You hook it up and go. There are some additional benefits:

- Most of these chargers are automatic (they turn off when done)
- They can maintain your battery with a trickle charge when you want to store it
- They still work with regular, non-AGM batteries
- They have advanced functionality, like desulfation, a major battery killer

This is the easiest way to charge or maintain an AGM battery like an Optima.
Trick Your "Standard" Charger With Another Battery

If you don't want to buy an AGM charger, no problem. You can DIY a charging setup in a pinch. Here's what you need:

- a regular battery charger
- a battery that has been discharged to around 12.2 volts (could be a little more or less)
- jumper cables
- a multimeter

The general concept here is that you charge the discharged "regular" battery with the battery charger, but you also hook up the Optima to piggyback on the regular battery.

What we're doing is this:

The charger sees the voltage in the Optima as too low to charge. The regular battery has a higher voltage, but still needs to be charged - the charger will want it to be at least 12.7 volts. This is not too low to charge, so the charger will turn on and flow current.

By attaching the Optima to the regular battery, we can draw off some current to charge the Optima.

The goal here is to get the Optima up to 10.5 volts, then hook it directly to your charger.

Here's how to do it:

Hook the Optima to the regular battery in parallel with the jumper cables. (positive to positive, negative to negative)

Connect the charger to the regular battery and turn it on.

Wait and hour and check the Optima. If it's hot to the touch or gassing out the vents, shut it down! The battery is no good. Warm to the touch is okay.

At this point you're going to start checking the Optima's voltage frequently for the next hour. Once it reaches 10.5V on your multimeter, turn off the charger and disconnect the regular battery.

Hook the Optima battery to the charger and charge as normal.

The process to get to 10.5 V should not take more than a 2 hours.